Delicate Co-operation – Developing County

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SUMMARY

When I chose the topic of my dissertation I wanted to get involved in a research that can be useful for my home region and can use the resources of my country in the most efficient way. On first sight Hungary is obviously an agricultural country with great tillable areas so the initial "ingredients" are given. Nevertheless my mission held some surprises. First I had to focus on a special area of agribusiness sector which is quite difficult considering the numerous relations of this sector to others as bio-fuels, food processing, tourism, etc. The basic step was to examine the sector as an integral entity. These studies showed the fundamental problems of the field but did not lead to further steps. Regardless of this fact I tried to collect good practices throughout the European agricultural and food clusters. Some essential assumptions can be derived from these data for the visions and field of activity but most of them cannot tell about the formation of these clusters. Of course they had tradition in the specific area but Hungary has also (at least from our point of view) a successful history in agriculture and husbandry. This paper is an introduction to the agricultural cluster possibilities in Hungary examining the specialties in the agricultural sector, and it tries to give an idea of a combined way of creating small agribusiness clusters and bringing business opportunities into the region.
Keywords: agricultural clusters
Journal of Economic Literature (JEL) code: Q13, Q16

MOTIVATION

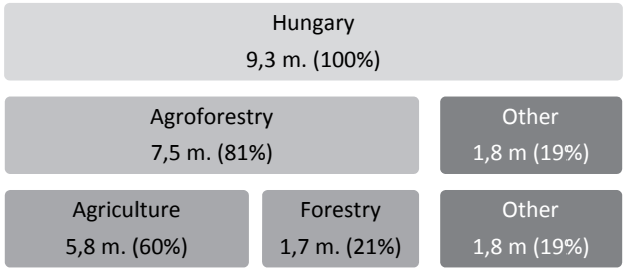
My motivation is regional development in my home region, because it is really underdeveloped in terms of GDP per capita and employment compared to the other EU-27 regions. An appropriate model is needed to enhance regional development. First I was enthusiastic about agriculture because somehow our culture is certain about the value of the "land". Somehow the usage of this renewable resource is unbound. I was wondering whether it was related to the geographical and climate circumstances but it isn't. So I have decided to examine the structure of agriculture and its contribution to GDP and employment. After having an aim to investigate on the resource side I stated the question: What if the management of agriculture is not proper? What kind of proper solution can there be for these problems?

My Master's thesis was written about Hungarian Nanotechnology and Material Science cluster, so I have chosen to work with clusters. Cluster policy is strongly related to regional development. Accordingly I collected information on the development policies and about competition including (Absolut/Relative/Comparative/Competitive advantages/Heckser-Ohlin model/Structure-Conduct-Performance Paradigm), because cluster is a kind of "co-opetitive" phenomena. After the theoretical summing-up I realized that most of the cluster based regional development programs are dealing with only high-tech branches such as the energy, automotive, or biotech industries. However, in some countries such as in Denmark, Ireland or France there are regions which have successful agricultural clusters. If they can achieve good results, maybe we can also. The structure of this paper is the following:

1. Summary of agricultural situation in Hungary
2. Introduction to network and cluster type co-operations
3. International trends for agribusiness clusters
4. A possible way to start an agricultural network in small towns in the region

STATISTICAL ANALYSIS OF THE AGRICULTURAL SECTOR

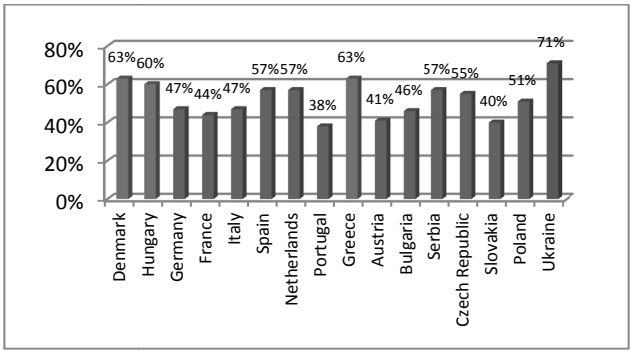
The main problem is that agricultural land is not used as it should be. According to that I collected data about the situation of agribusiness in Hungary, and then I made an analysis about it. The analyzed data was the GDP share of agriculture, employment in agriculture, sector structure. The analysis shows that the share of agricultural land is high within the country. When we think about the agro-forestry sector it represents 80% of the whole area of Hungary. Figure 1.



Source: KSH

Figure 1. Land Use in Hungary in Hectare

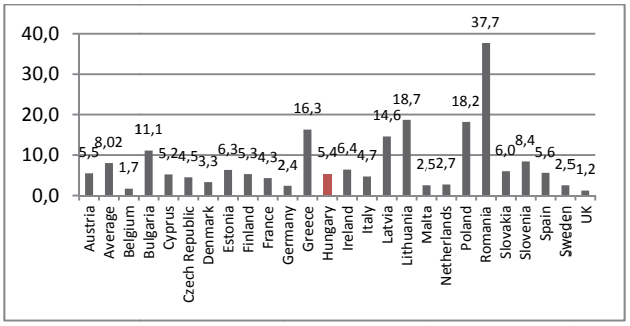
The areas used for only agricultural production is about 60%. Of the 27 countries of the European Union Hungary, Greece and Denmark has the highest rate in agricultural land use (Figure 2). Considering the fact that these countries are not the biggest of the federation it is also obvious that this is only a relatively high value, because the greater nations have more land in total. To define the opportunities for a country I think we can say that good quality soil can be a powerful resource in the future.



Source: World Bank Database

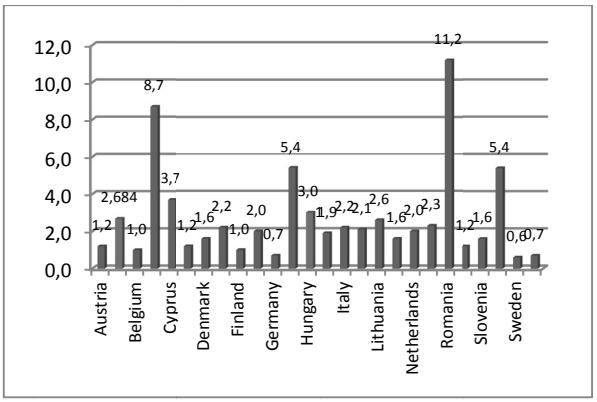
Figure 2. Agricultural Land Use in Some of the European Countries

If we are so lucky because of our land usage it must be represented in the economic indicators. The contribution of agriculture to the GDP and to employment is about or below the EU-27 average (Figure 3 and 4). This shows that owning a great resource is fairly not enough to have any kind of benefits from it. The world tendency is of course a decrease in the importance of agriculture in the developed countries.



Source: World Bank Database

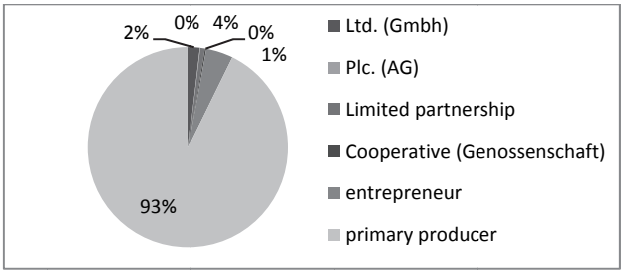
Figure 3. Employment of the Population in Agriculture



Source: World Bank Database

Figure 4. Agricultural Contribution to GDP in the EU and the Average

Another problem can be that the structure of the agricultural sector is really fragmented. Most of the actors in this sector are primary producers (Figure 5). They are the basic elements of the agricultural system. A lot of them are unable to market their own products because they are far from achieving the economies of scale. Without co-operation or great investments they will not reach this level. To see the significance of this set we must know that the primary producers create 60% of the value in the sector, but they are not working together so their effectiveness is insufficient. This could be a potential field of intervention. I believe that in network-type co-operations these producers can be supported and their products can be sold through a well managed supply chain. Later on I will refer to this kind of solution as a horizontal network where the coordinator actor manages the collection and merchandising of the products. This co-operation is also known as community farming or community supported agriculture.



Source: KSH

Figure 5. Structure of the Agricultural Sector in Hungary

This idea can lead us forward to new kind of farming ideas:

„New forms of property ownership—the land is held in common by a community through a legal trust. The trust then leases its property long-term to farmers who use the land to grow food for the community.

New forms of cooperation—a network of human relations replaces old systems of employers and employees as well as replacing the practice of pledging material security (land, buildings, etc.) to banks.

New forms of economy – (associative economy). The guiding question is not "how do we increase profits?" but rather

"what are the actual needs of the land and of the people involved in this enterprise?"(McFadden, 2004)

The primary resource soil is perfect in Hungary and the ecological attributes are also appropriate. The climate is not the problem either. International practice shows that agriculture is driven by clusters in those countries where equipment, technology, and experience and tradition are available (the Netherlands, Denmark, Austria, etc.). My region is not well supplied with these resources.

To have a short view of the causes of this situation I would like to share data in comparison to other European countries:

- Hungarian agriculture has poor supply of machinery (32% of EU average and 17-20% of the German in terms of agricultural machines)
- Low efficiency (there is 5 times greater efficiency in Germany meaning that the crop yield in agriculture (handled as one) is 20% of the German value)
- Export intensity is extremely low (The Netherlands 11.112 USD/ha , Denmark 3.279 USD/ha; Hungary 372 USD/ha) (We must consider that The Netherlands are of course a special case, but Denmark has also export intensity per hectare that is ten times higher than that of Hungary)
- Food imports grow rapidly from year to year (In connection with this tendency we must think about local sustainability which I will discuss later)
- Horizontal network establishment with the small and medium-sized enterprises (SMEs) are needed (Bottom-up initiations can be really useful in a so fragmented a sector using the co-operational workforce of the primary producers)

DRIVING FORCES OF NETWORKS

All of the cooperation among the economic actors can be defined as a kind of network. From this point of view the whole global economy is one enormous network where smaller networks are competing. There is no general agreement on the term of business network or business cluster there is no general agreement. Usually a business cluster is "a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally." (Porter 1990) For this article let us define a business network as a conglomeration of cooperating producers and companies where they jointly create value needed by the customers. Table 1. show the difference between a hierarchical company, a network, and the market itself :

Network type cooperation is one of the best solutions for high flexibility, real-time customer adaption, regional development, and to ensure competitiveness of the members. Network cooperation is usually more productive for the members than the separated work. The benefits usually come from the synergetic cooperation of the member.

Table 1
Comparison of Different Types of Organizations
(Based on Powell 1990)

Key features	Hierarchy	Network	Market
Co-operation	Closed	Opened in time and space	Opened in time and space
Degree of Integration	Vertical	Hybrid	Horizontal
Degree of Flexibility	Low	Medium	High
Degree of Adaption	Slow and discontinuous	Fast and continuous	Prompt and continuous
Type of production	Mass-production	Tailor-made	Non-specific (wide range)

Here I discuss about developing organizational structures and management tools. These show the different co-operational styles and the forms for companies. My goal was to have a clear view on the different terms used by the scientific literature. The literature in the different countries has use a uses a wide range of terms for network-type co-operations.

Four types of business networks are defined as:

1. Horizontal
2. Vertical
3. Hybrid
4. Occasional

In this study I only show two examples of the four categories. A horizontal network in agriculture can be co-operation between the primary producers and a coordinator. The coordinator's role is to create a link between the primary producers and the consumers. The coordinator's work is basically logistical. Beyond the collection and distribution of products the coordinator has to create an informational system which can handle the demands of the customers and can also create the supply structure of the primary producers. The products of the primary producers can vary in a wide range. There is seasonality in these products so the creation of a sustainable chain can be really difficult. This kind of cooperation is based on human relations rather than on the classical form of distribution.

A vertical network is easily defined when our integrator company is in food processing sector. In this case the integrator creates the network to ensure the continuous production and delivery to the costumers.

The German approach differs in other ways as well. The dimensions are research profile (basic or applied) and financing (public or private). It is obvious that networks and clusters are highly financed by the public actors of the economy. The Hungarian practice differs a lot from this and maybe it is also the main cause of efficiency problems. To summarize the theoretical part I should say that clusters from my point of view are "just" special networks with mixed (public and private) funding and with co-operation with researchers. (Universities, research centers, labs, etc.) From this point of view network theories can also be used for clustering for example scale-free network theory.

My basic ideas about the creation of agricultural clusters are the following:

- We must start from the lowest point of the agricultural system (Primary Producer)
- Human relations must be used to create the network
- Business network should start from the beginning, so the scale is also small
- Further development is based on the original network, but the experiences can be used to create new networks as well

To ensure that people want to join the network, I collected the potential benefits for future cluster members. Table 2 shows a mature cluster form, where all the member-types are involved in the common work.

Table 2
Individual and Common Benefits of Agricultural Clusters

Member	Benefit for member	Benefit for cluster
Seed industry	New markets, market concentration, publicity	Bargaining options for primary producers
Agri Machinery	New markets, market concentration, publicity	Bargaining options for primary producers
Primary producer	Concentrated technology and resource base, fix buyer chain	Producing market demanded high quality competitve products – Primary product comes from them
Food industry	Predictable quality and amount of products, cost reduction	Integrated chain "from farm to table", Purchase power
Wholesaler	Bargaining options (cost reduction for wholesaler)	Given purchasing chain
Logistic services	New markets	Bargaining options (cost reduction)
Universities, civil sector	Field of research, Relational capital	Knowledge transfer, Information flow from customers

EUROPEAN CLUSTER ANALYSIS

The policies are not clear so an appropriate model should be designed. I wished to investigate the European trends in clustering that is why I examined the European clusters in the agricultural (Figure 6) and food sector (Figure 7). (5 picked out of 115 from 5 different EU countries) The analysis showed the international trends, the strategy, the structure and the field of activity of these clusters. According to Eva Galvez Nogales:

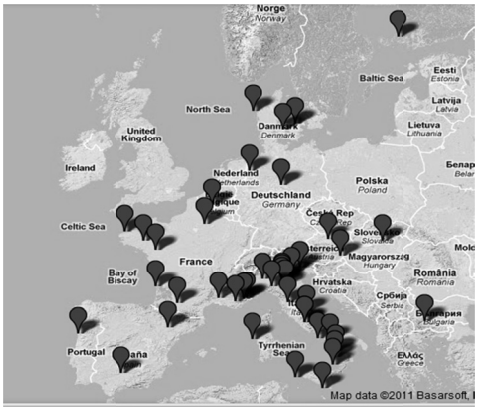
„New agriculture needs new tools to enhance its competitiveness and innovation capacity. One of these tools is the promotion of clusters."

Agricultural Cluster (AC) initiatives are handled as a key approach to help improving the agricultural sector of many countries.

Potential AC members include:

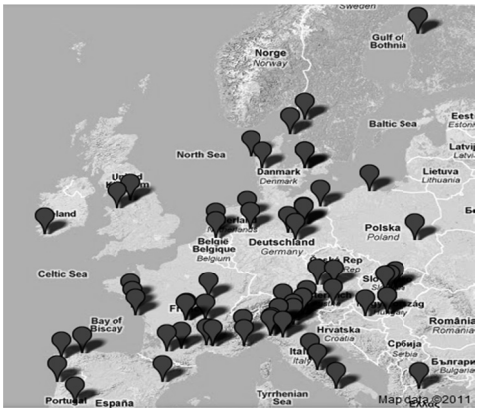
- Seed industry companies
- Agro-machinery companies
- Primary producers
- Food industry companies
- Logistic centers
- Bio-fuel companies
- Universities, R&D companies, civil sector, etc.

To see the relevance of the agro-based clusters, I would like to present some facts about the agricultural clusters in the EU-27. Currently there are three fields interesting for me in means of establishment of a cluster in Hungary. (These are: traditional agricultural sector (47 clsuters), the farming and animal husbandry sector (8 clusters), and the food sector (58 clsuters)) Naturally these three sectors overlap each other. For instance in Italy most of the clusters define themselves as food and agricultural cluster at the same time. Of course it is not easy to define separated fields but in my paper I will use those which are represented by the Cluster Observatory.(See Figures 6 and 7)



Source: European Cluster Observatory powered by Google

Figure 6. Agricultural Clusters in the EU



Source: European Cluster Observatory powered by Google

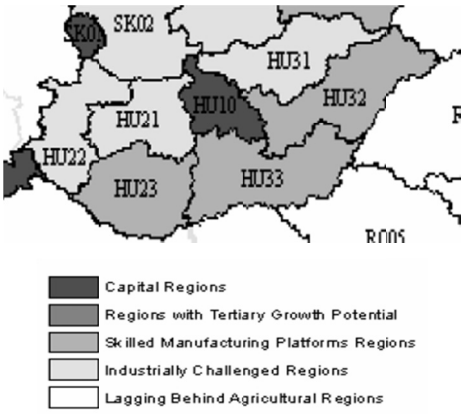
Figure 7. Food Clusters in the EU

We can see that in Europe agricultural and food clusters are common phenomena. This means that they are active forms of co-operations. Most of these clusters have historical experiences in co-operation. The clusters are usually based on local geographical possibilities and most of them would like to satisfy the needs of local inhabitants. That does not mean that they only market their products locally, but the self-sustainability of the surrounding region is an important issue when creating an agricultural network. The summary below would like to generate ideas and maybe to enhance the idea of regional development through cluster co-operations.

Table 3
Summary of Five Agribusiness Cluster Visions and Field of Activities

Austria	Denmark	Germany	France	Belgium
Production of high-quality and safe products with innovative food processing techniques	Knowledge based regional economic growth	Improve food industry	To become a world reference for innovation for the production of eco-friendly and health friendly plants	Bringing manufacturers together
Marketing of regional and organic products	Projects within food and health, production and sustainability and gastronomy and sensation	Emphasise Lower Saxony's advantages as a prime location for a sustainable and efficient market-oriented food industry	Lower consumption of inputs	Developing the spirit of innovation
Promote existing native competencies			Saving biodiversity	Improving the profitability of networks
Introduction of innovative products, new technologies and processes			Positive effect on Health and the Environment	Improving competition between companies in the food industry, and boosting business and employment in the sector
Agricultural production, food processing, trade and industry	Traditional Food	Food processing and food safety	Ornamental horticulture	Health foods/Nutritional quality (R&D)
Processing, cleaning supplies, pest control, packaging	Health and lifestyle Profile	Development of new functional foods	Fruit & vegetable growing	Industrial efficiency (production, quality, safety, competency management and training)
Manufacturers of machines and equipment for food	Functional Food	Designing and implementing optimized production lines	Seeds	Packaging (less packaging, biodegradable)
R&D, laboratories, consultants and more	Pure Pharmaceutical	Education, Qualification, professional training and further education	Medicinal and aromatic plants	Development of durable networks in the food industry (optimizing and creating sustainable and responsible management for the production chain)

This table shows that all of the chosen clusters are committed in regional development, so the idea of linking agricultural clustering with economic development is sound. Another point of interest is the emphasis on healthy, safe and functional foods. This shows us the European trend of the needs of the customers. If we would like to create an agribusiness cluster we must focus on these needs. Only high quality and healthy food is marketable. We must focus on the fact the food factory products are losing their markets and bio or free range animal husbandry are becoming more favorably viewed. Local competencies in the agricultural products must be emphasized and used as a differentiating factor. This can give the local networks a competitive advantage. The first step should be the examination of the production structure of a chosen area and then further improvements can be carried out.



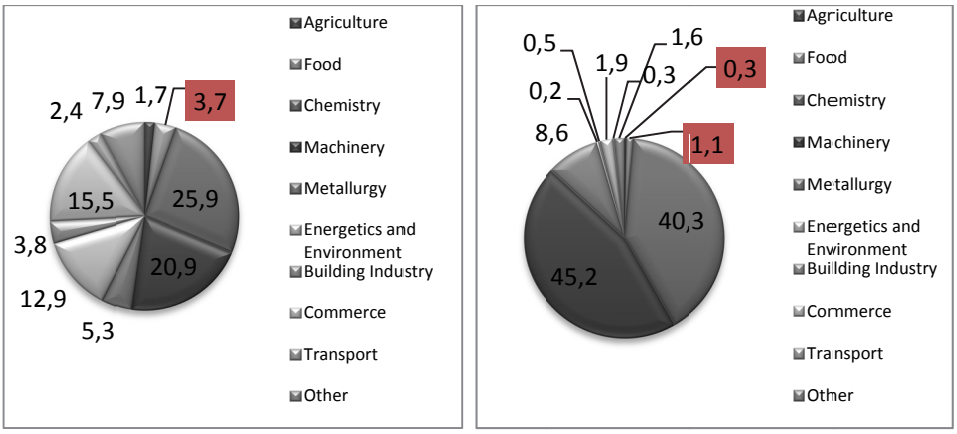
Source: Fraunhofer ISI study

Figure 8. Regional Analysis of Hungarian Regions

SUMMARY

North Hungary and my hometown Miskolc, is the regional center. Fraunhofer ISI made a regional analysis in the EU27 and examined Hungary as well. Figure 8 shows that North Hungary is an industrially challenged region, which should improve its economy. But the question is, in which area should we develop ourselves?

To answer this question I examined the different sectors of the region and more specifically the county of Borsod-Abaúj-Zemplén. Cluster co-operations are used in those sectors which are really innovative and are highly important for the region. If they are suitable only for these sectors, than regional development through agricultural cluster initiatives are not viable. From another point of view maybe self-supporting systems can also be formed as a network or cluster and not connected primarily to high-tech branches.



Source: KSH

Figure 9. Share of Revenue (Left side) and Export (Right side)

Figure 9 demonstrates that the agricultural sector makes a low contribution to the region's economic welfare in terms of revenue and export. The TOP100 companies in B-A-Z County contain only four agricultural companies, so we cannot use them as integrators for a vertical network. In this county it is also true, that the sector consists of mainly primary producers. If we want to see changes in agriculture we must start from the lowest points of co-operation. This could be the backyard of the small towns.

If we dare to dream big we have to consider the world tendencies as well. In the new century agriculture has faced the problems and opportunities of globalization. Due to this, it has to reshape itself and define new goals. The need for high-value added, safe and high-quality products is also a relevant trend in the agricultural sector. The agro-industry contains the bio-fuel industry, the food processing sector and the supporting machinery and equipment producing areas as well. Logistic processes such as packaging and retailing are also vital part of the industry. A basic logistic function can be the establishment of community farming systems in the beginning. After the early experiences we have to decide the way of expansion. We can either supply local communities or we can think about specialization for characteristic products of the different areas. In this way a small region may be able to produce original and especial products that can be marketed in the whole country. I do not wish to think on a bigger scale, because the basic steps are missing. So far.

Acknowledgement

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